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| 10/550,512 | 09/23/2005 | Hiromasa Sakai | 040302-0503 | 1973 |
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| FOLEY AND LARDNER LLP | | | BARROW, AMANDA J | |
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

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|------------------------------|--------------------------------------|--|
| Office Action Summary | Application No. 10/550,512 | Applicant(s) SAKAI, HIROMASA |
| | Examiner AMANDA BARROW | Art Unit 1795 |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
 - If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
 - Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED. (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) Responsive to communication(s) filed on 23 April 2009.
 2a) This action is FINAL. 2b) This action is non-final.
 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) Claim(s) 1-11 is/are pending in the application.
 4a) Of the above claim(s) 2-5 is/are withdrawn from consideration.
 5) Claim(s) _____ is/are allowed.
 6) Claim(s) 1 and 6-11 is/are rejected.
 7) Claim(s) _____ is/are objected to.
 8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) The specification is objected to by the Examiner.
 10) The drawing(s) filed on 23 September 2005 is/are: a) accepted or b) objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) All b) Some * c) None of:
 1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. _____.
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. The Applicant's amendment filed on 4/23/2009 was received. The specification was amended in accordance with the suggestions in the Office Action to overcome the objection based on informalities as the specification is now in proper idiomatic English . Claims 1, 8 and 9 have been amended in accordance with the suggestions in the Office Action to overcome the objection based on informalities. Claims 2-5 were cancelled. Claims 1 and 6-11 were amended.

Claim Rejections - 35 USC § 102/103

2. The texts of those sections of Title 35, U.S.C. code not included in this action can be found in the prior Office Action issued on 12/23/08.

3. The claim rejections under 35 U.S.C. 102(e) as being anticipated or in the alternative, under 35 U.S.C. 103(a) as obvious over Noetzel et al. on claims 1 and 10 are maintained. As claim 1 and 10 were amended to incorporate the claim limitations from canceled claims 2-5, the rejection of claims 1 and 10 now includes the rejection from these claims. The rejection is repeated below for convenience.

Claim Rejections - 35 USC § 102

4. The claim rejections under 35 U.S.C. 102(c) as being anticipated over Noetzel et al. on claim 11 is maintained. As claim 11 was amended to incorporate the claim limitations from canceled claims 2-5, the rejection of claims 1 and 10 now includes the rejection of these claims.

Claim Rejections - 35 USC § 103

5. The claim rejection under 35 U.S.C. 103(a) as being unpatentable over Noetzel in view of Ito on claim 6 is maintained. The rejection is repeated below for convenience.

6. The claim rejection under 35 U.S.C. 103(a) as being unpatentable over Noetzel in view of Matoba on claims 7 and 8 are maintained. The rejection is repeated below for convenience.

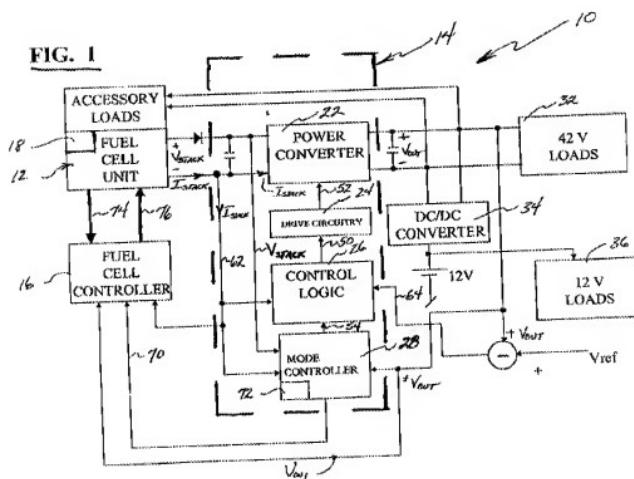
7. The claim rejection under 35 U.S.C. 103(a) as being unpatentable over Noetzel and Matoba in view of Beutel on claim 9 is maintained. The rejection is repeated below for convenience.

Claim Rejections Repeated from former Office Action

8. Regarding claim 1, Noetzel teaches a control device (power conditioner 14) of a vehicular fuel cell system illustrated in Figures 1 and 2 below compromising: a warm-up output control section operative (power switching device 42) that allows a fuel cell system stack (18) of a fuel cell system (10) to be warmed up under a low temperature condition causing the fuel cell stack to generate electric power to allow predetermined warm-up electric power to be taken out ("In a current blocking mode [such as start-up], ...the power switching device 42 disallows substantially all current flow from the fuel cell unit 12, thereby enabling fuel cell unit 12 to operate in a substantially unloaded condition" (paragraph 22)); and a run permission section operative (power switching device 42) that discriminates whether the fuel cell stack assumes a predetermined warm-up condition on the basis of either a voltage value or an electric current value of the fuel cell stack and providing run permission to a vehicle if it assumes the predetermined warm-up condition ("A power conditioner electrically connected to the fuel cell

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unit includes a power switching device. The power switching device selectively connects and disconnects the fuel cell voltage to at least one load dependent at least in part upon an operating temperature of the fuel cell stack, the fuel cell voltage, and the fuel cell current to thereby produce an output voltage" (paragraph 10)).

FIG. 1

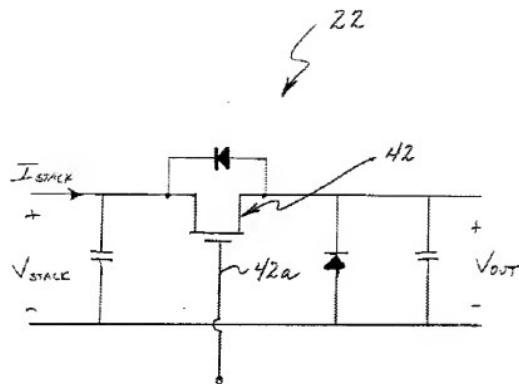


FIG. 2.

In the case of the 102 rejection, claim 1 is anticipated in that the power conditioner of Noetzel provides all functions done by the warm-up output control section operative and the run permission section operative. In the case of the 103 rejection, it would have been obvious to one of ordinary skill in the art to take the power conditioner of Noetzel and break it down into two entities (namely, the warm-up output control section operative and a run permission section operative), as the two entities can perform the same functions together or separately. This is an example of taking known work in one field of endeavor and making variations of it in the same field based on design incentives or other market forces (See MPEP 2143).

Regarding claim 1, Noetzel teaches a control device (power conditioner 14) where the run permission section (power switching device 42) provides the vehicle with run permission when the voltage value of the fuel cell stack is equal to or more than a predetermined value:

"The power switching device selectively connects and disconnects the fuel cell voltage to at least one load dependent at least in part.... by the fuel cell voltage" (paragraph 10). In the alternative, Noetzel teaches a control device (power conditioner 14) where the run permission section (power switching device 42) provides the vehicle with run permission when the electric current value of the fuel cell stack is equal to or more than a predetermined value: "The power switching device selectively connects and disconnects the fuel cell voltage to at least one load dependent at least in part.... by the fuel cell current" (paragraph 10).

Furthermore, Noetzel teaches a control device (power conditioner 14) that determines the predetermined value in dependence upon an electric current value or a voltage value appearing when the fuel cell stack generates electric power:

"The mode controller... (which is part of the power conditioner 14) determines the mode in which power conditioner 14 and fuel cell unit 12 operate in order to maintain efficient operation... Mode controller 28 issues converter mode signal 54 which is indicative of the operational mode that is most efficient given the operating conditions and parameters of fuel cell unit 12 and power conditioner 14. Mode controller 28 issues to fuel cell controller 16 a cell operational control signal 70, which is indicative of any adjustments necessary to the output, such as, for example I_{STACK} and V_{STACK} " (where I_{STACK} is the current of the fuel cell stack and V_{STACK} is the voltage of the fuel cell stack) (paragraph 26).

Regarding claim 10, Noetzel teaches a control device (power conditioner 14) of a vehicular fuel cell system illustrated in Figures 1 and 2 above compromising a warm-up output controlling means and a run permission provided means both embodied in a power switching device (42) as demonstrated in the arguments above for claim 1. As claim 10 does not provide any new means not already written in claim 1, see the above arguments.

The Applicant's specification supports the "means... for controlling the fuel cell stack" and the "means... for providing a vehicle with run permission" as recited in claim 10 (see Applicant's specification, page 5, lines 15-30). Accordingly, this means-plus-function language

invokes a 35 U.S.C. 112, sixth paragraph limitation (see MPEP 2181). The means "for controlling the fuel cell stack" and the means for "providing a vehicle with run permission" are interpreted to be a control device comprised of a warm-up output control section operative and a run permission section that make determinations on the temperature of the fuel cell on the basis of current and voltage values of the fuel cell.

Claim Rejections - 35 USC § 102

9. Claim 11 is rejected under 35 U.S.C. 102(e) as being anticipated by Noetzel et al. (U.S. Patent Application Publication 2003/0235730) (hereinafter "Noetzel").

Regarding claim 11, Noetzel teaches a method of controlling a fuel cell system compromising taking out predetermined warm-up electric power by controlling the fuel cell stack to generate electric power under a low temperature condition and in the case that the fuel cell system is warmed up, providing a vehicle with run permission based on the voltage and electric current values of the fuel cell stack:

"Once a fuel cell unit 12 reaches its operating or use temperature, fuel cell unit 12 exits the start-up mode and enters the operating mode. The readiness of fuel cell unit 12 to enter the operating mode is detected by mode controller 28, through monitoring of I_{STACK} and V_{STACK} , which alters mode signal 54 accordingly" (paragraph 32). Also, see claims 13-16 of Noetzel.

Claim 11 was amended to add the claim limitations of the canceled claims 2-5. The rejection of these claim limitations can be found in the rejection of claim 1, which also incorporated the limitations of canceled claims 2-5.

Claim Rejections - 35 USC § 103

10. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Noetzel as applied to claim 1 above, and further in view of Ito (Japanese Patent 2002-134150A).

11. Regarding claim 6, Noetzel teaches the run permission section (power switching device 42) providing the vehicle with run permission when the temperature of the fuel cell stack is equal to or more than a predetermined value (paragraph 10); however, Noetzel does not teach that the vehicle is provided with run permission based specifically on the temperature of the coolant in the fuel cell stack. Ito provides a similar system to Noetzel and does teach the temperature of the coolant in the fuel cell stack providing information so that the vehicle is provided with run permission: "the above standby detection means detects standby of the above-mentioned fuel cell by the above-mentioned cooling method... based on the temperature of the above-mentioned cooling water [that flows through the fuel cell stack]" (paragraphs 1-9).

This is an example of combining prior art elements according to known methods to yield predictable results (MPEP 2143). It would have been obvious to one of ordinary skill in the art to have adapted the detection means determined by temperature of coolant taught by Ito to the control device of Noetzel to provide another means to determine whether the vehicle is provided with run permission.

12. Claims 7 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Noetzel as applied to claim 1 above, and further in view of Matoba (U.S. Patent Application Publication 2004/0005487).

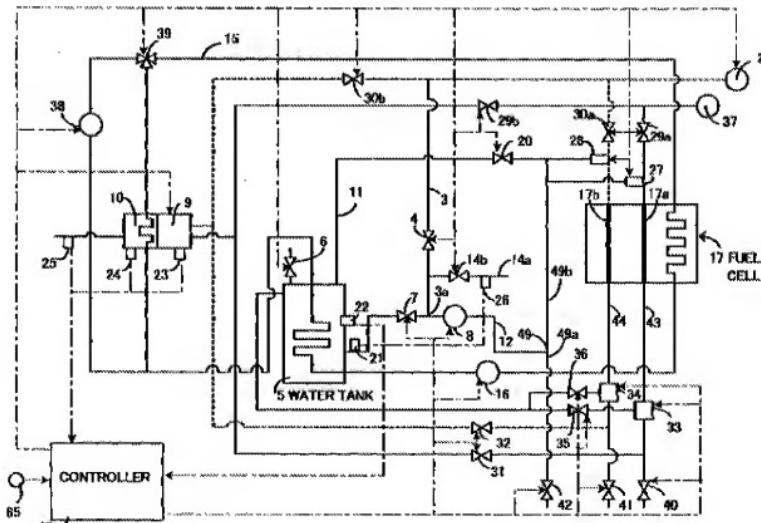
Regarding claim 7, Noetzel teaches the overall fuel cell system including a run permission section, but fails to teach that when the temperature of coolant in the fuel cell stack is

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less than a predetermined value, an auxiliary device is provided to a power plant including the fuel cell stack in order to heat the fuel cell stack. Matoba does teach this:

"The combustor 9 produces combustion gas using the effluent supplied from the fuel cell 17. The produced combustion gas is supplied to a heat exchanger 10 and used as a heat source... to heat coolant used in the cooling system of the fuel cell 17" (paragraph 25).

Therefore, Matoba teaches an auxiliary device (combustor 9) to provide power to a fuel cell stack (17) in order to heat the stack as is illustrated in Figure 1 below:



operating conditions more quickly. This is an example of combining prior art elements according to known methods to yield predictable results (see MPEP 2143).

Regarding claim 8, Matoba teaches that the auxiliary device (combustor 9) includes a combustor to which exhaust emitted from the fuel cell stack is introduced; in this case, the combustor is one in the same with the auxiliary device. As the combustor of Matoba performs all the same functions as the auxiliary device and combustor of this patent application, it is not necessary to have a separate entity entitled "auxiliary device."

13. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Noetzel and Matoba as applied to claims 7 and 8 above, and further in view of Beutel et al. (U.S. Patent Application 2002/0134239 A1) (hereinafter "Beutel").

Regarding claim 9, Matoba teaches a combustor section (9) combusting the exhaust and a heat exchanger (10) allowing combustion heat of the exhaust to be transferred to the coolant as is illustrated in Figure 1 above (paragraphs 25-29), but fails to teach the rest of the claim. Beutel teaches the rest of the claim and discloses that it is well known in the art to provide a combustor with an electric-heated catalyst section operative that is heated to a catalytic active temperature by electric heat and that the catalytic combustor section combusts the exhaust (paragraph 6).

This is an example of combining prior art elements according to known methods to yield predictable results (see MPEP 2143). It would have been obvious to one of ordinary skill in the art to combine the combustor with an electric-heated catalyst section operative of Beutel to the combustor of Matoba in order to make sure the effluent contains no hydrocarbons and is completely combusted.

Response to Arguments

14. Applicant's arguments filed on April 23, 2009 have been fully considered but they are not persuasive.

Applicant's principal arguments are

(a) Noetzel does not disclose or suggest a control device in which a run permission section is configured to provide a vehicle with a run permission when the voltage value of the fuel cell stack is equal to or more than a predetermined voltage value that is necessary before vehicle may commence travel, wherein the voltage value is determined in dependence upon an electric current value that occurs when the fuel cell stack generates electric power

(b) Noetzel does not disclose or suggest a control device in which a run permission section is configured to provide a vehicle with a run permission when the electric current value of the fuel cell stack is equal to or less than a predetermined current value that is necessary before vehicle may commence travel, wherein the voltage value is determined in dependence upon a voltage value that occurs when the fuel cell stack generates electric power

In response to Applicant's arguments, please consider the following comments.

Noetzel teaches a power-switching device 42 that controls the current flowing from the fuel cell unit 12 to a load 32 that is operated in one of three modes dependent at least in part upon the signal applied to control terminal 42a. In a current blocking mode ("warm-up mode") the power switching device 42 disallows substantially all current flow from the fuel cell unit 12 thereby enabling the fuel cell unit 12 to operate in a substantially unloaded condition (paragraph 22). In another mode, the voltage is maintained within a predetermined voltage range ("run

permission mode") (paragraph 22). The mode in which power switching device 42 is operating is dependent at least in part upon drive signal 52 (paragraph 24) and, "The power switching device selectively connects and disconnects the fuel cell voltage to at least one load dependent at least in part.... by the operating temperature of the fuel cell stack, the fuel cell voltage or the fuel cell current." (paragraph 10).

Furthermore, Noetzel teaches a control device (power conditioner 14) that determines the predetermined value in dependence upon an electric current value or a voltage value appearing when the fuel cell stack generates electric power:

"The mode controller... (which is part of the power conditioner 14) determines the mode in which power conditioner 14 and fuel cell unit 12 operate in order to maintain efficient operation... Mode controller 28 issues converter mode signal 54 which is indicative of the operational mode that is most efficient given the operating conditions and parameters of fuel cell unit 12 and power conditioner 14. Mode controller 28 issues to fuel cell controller 16 a cell operational control signal 70, which is indicative of any adjustments necessary to the output, such as, for example I_{STACK} and V_{STACK} " (where I_{STACK} is the current of the fuel cell stack and V_{STACK} is the voltage of the fuel cell stack) (paragraph 26).

Therefore, in reference to the aforementioned statements and prior rejection, Noetzel clearly teaches that which is claimed. Applicant's arguments do not comply with 37 CFR 1.111(c) because they do not clearly point out the patentable novelty which he or she thinks the claims present in view of the state of the art disclosed by the references cited or the objections made. Further, they do not show how the amendments avoid such references or objections.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to AMANDA BARROW whose telephone number is (571)270-7867. The examiner can normally be reached on 7:30am-5pm EST, Monday-Friday, alternate Fridays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Brian Sines can be reached on 571-272-1263. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/AMANDA BARROW/
Examiner, Art Unit 1795

/Brian J. Sines/

Supervisory Patent Examiner, Art Unit 1795